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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,784	MURAKAMI, NAOYA	
	Examiner	Art Unit	
	MARCUS T. RILEY	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *1-10 and 17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-16 and 18-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/03/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is responsive to the applicant's remarks received on July 30, 2008. **Claims 11-16** and newly added **claims18-21** are pending. **Claims 1-10 &17** have been canceled.

Response to Arguments

2. Applicant's arguments with respect to **claims 1-10 & 17** have been canceled and are withdrawn from consideration. Applicant's arguments with respect to **claim 11-16** and newly added **claims 18-21** filed on July 30, 2008 has been fully considered but they are not persuasive.

A: Applicant's Remarks

For Applicant's arguments & remarks, see *"Applicant's Arguments/Remarks Made in Amendment"* filed on July 30, 2008.

A: Examiners Answer

Claims 11-13, 15, 16 and newly added claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US 5,784,180 hereinafter, Sakai '180) in combination with Ikeda et al. (US 5,550,638 Ikeda '638, and further in view of Kanno et al. (US 6,434,266 hereinafter Kanno '266). Claims 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai '180 in combination with Ikeda '638. Thus, claims 11-16 and 18-21 are now pending in this application for consideration. Note: Examiner has corrected the typographical error where claim 14 was listed as rejected

under Sakai, Ikeda and Kanno. The Office Action now reflects the claim 14 is now rejected under Sakai and Ikeda.

Examiner respectfully submits that each of the pending claims are not patentably distinguishable over the cited references as required by § 103. Examiner further submits that the cited references, whether considered alone or in combination, discloses, teaches or suggests Applicant's claimed image reading method including the step of "storing a digital monochromatic signal and digital color signals that are output from the BK line sensor and the R, G and B line sensors as a black reference data with a light source turned off" as required by independent claims 11, 12, 14 and 16 and including the step of "storing a digital monochromatic signal and digital color signals that are output from the BK line sensor and the R, G and B line sensors as a white reference data with a light source turned on" as required by independent claims 11, 12 and 16. By contrast, the cited references do not fail to disclose, teach or suggest these claimed features. Examiner relies on Sakai '180 at column 1, lines 24-28 and column 6, lines 38-45 (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.*** *In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503****, performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6, lines 38-45). It is well known in the art that black and white represents colors in a color image processing apparatus. Sakai teaches, discloses and even suggests a plurality of colors. Thus, the cited references teach, disclose or suggests this claimed feature.

Accordingly, independent claims 11, 12, 14 and 16 and claims dependent therefrom, are not patentably distinguishable over the cited references.

The claims are not distinguishable over the cited references. Claims 11-16 stand rejected as being unpatentable over the combination of Sakai, Ikeda and Kanno. Examiner, respectfully submit that these claims are not allowable because the cited references disclose, teach or suggest all the claim recitation.

Embodiments of the present invention relate to an image reading method. The image reading method according to independent claim 14 includes the step of preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors. Examiner relies on Ikeda '638 where Ikeda '638 discloses preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors {See Figs. 3A &3B which represents a CCD Sensor and R, G, B line sensors (*"First, third, and fifth sensors (or CCDs) (58a, 60a, and 62a) are arranged on a line LA, and* ***second and fourth sensors are arranged on a line LB separated from the line LA by four lines*** *(63.5 .mu.m.times.4=254 .mu.m)."* column 7, lines 62-66). See also (*"Color image signals obtained by reading an original while dividing the original into five portions and input to the video image processing circuit are* ***separated into three colors, i.e., G (green), B (blue), and R (red) by the sample/hold (S/H) circuit 502a.*** *Therefore, after S/H processing, signals of 3x5=15 systems are subjected to signal processing. The analog color signals sampled and held by the S/H circuit 502a in units of* ***R, G, and B are convened to digital signals in units of first to fifth channels by the next A/D converter 503a.*** *"* column 8, lines 52-61).

Examiner relies on Sakai for storing the digital monochromatic signal outputted from the BK line sensor when the light is turned off, as a black reference data for a monochromatic signal (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.*** *In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See

also (*"**The control unit 13 performs the entire control of the color reader 1,** i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503, **performs ON/OFF control and light amount control** of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and **performs control of a digitizer** 16 or a display unit through a signal line 505."* column 6 , lines 38-45);

Examiner respectfully submits that Sakai also discloses, teaches or suggests storing a digital monochromatic signal and digital color signals that are output from the BK line sensor and the R, G and B line sensors as a black reference data with a light source turned off as required by the claims. (*"In such a system, **data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.** In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"**The control unit 13 performs the entire control of the color reader 1,** i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503, **performs ON/OFF control and light amount control** of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and **performs control of a digitizer** 16 or a display unit through a signal line 505."* column 6 , lines 38-45); Sakai discloses, teach or suggest storing image signals in shading correcting circuits. (***The R,G, and B digital signals are corrected by the shading correction circuit 3028 in the main scan direction.** In addition, a pixel shift in the main scan direction is performed by the pixel shift correction circuit 3029."* column 22, lines 36-40); (*"**A shading correction circuit 3028** performs **shading correction** of an output signal from the dark correction circuit 3027."* column 21, lines 22-24).

The combination of Sakai, Ikeda and Kanno whether alone or in combination teaches, discloses or suggests the claimed steps applicant presented. Thus, independent claims 11, 12, 14 and 16 are not allowable. Since independent claims 11, 12, 14 and 16 are not allowable, claims dependent therefrom, namely claims 13 and 15 as well as new claims 18-21 are also not allowable by virtue of their direct or indirect dependence from

allowable independent claims 11, 12, 14 and 16 and for containing other patentable features.

Furthermore, the requirements of MPEP § 2143 are satisfied in the Office Action with respect to any of the claims rejected as obvious because the cited references do teach each and every element of the present invention. Thus, the present claims are not allowable.

The ordinary artisan would have had a level of skill sufficient to render the invention obvious to that ordinary artisan. Specifically, before the disclosure of the present invention, the ordinary artisan would have had the skill to predict that the features of Sakai could be modified in accordance with Ikeda and/or Kanno as is asserted in the Office Action. The ordinary artisan would have had the skills to arrive at the present invention without instruction from the innovator.

Sakai is not devoid of any reason why one of skill in the art would incorporate the teachings of either Ikeda and/or Kanno into Sakai. The Office Action, states that combining the references would *"provide an image processing apparatus which can precisely reproduce an original"* and *"provide a color image processing apparatus and a color image processing method which makes it possible to suitably convert a color."* The motivation means that the ordinary artisan would have incorporated the features of Ikeda and Kanno into Sakai.

Therefore, the Examiner has properly articulated a reason for why one with ordinary skill in the art would combine the teachings of Ikeda, Kanno and Sakai. Because the Examiner has provided sufficient reasons to combine the teachings of Ikeda, Kanno

and Sakai, the rejection based on this combination is proper. Accordingly, claims 11-16 are rendered unpatentable over the prior art.

In summary, because of a sufficient suggestion or motivation in the prior art to modify the reference, the first requirement of MPEP § 2143 has been met and, hence, a prima facie case of obviousness has been established.

Applicant respectfully submits that independent claims 11, 12, 14 and 16, and claims dependent therefrom are not patentably distinguishable over the cited references and are not allowable.

Examiner respectfully submits that independent claims 11, 12, 14 and 16, and claims dependent therefrom are not patentably distinguishable over the cited reference. Thus, the present application is not in condition for allowance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 11-13, 15, 16, 18-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US 5,784,180 hereinafter, Sakai '180) in combination with Ikeda et al. (US 5,550,638 Ikeda '638, and further in view of Kanno et al. (US 6,434,266 hereinafter Kanno '266).

Regarding claim 11; Sakai 180 discloses an image reading method, comprising: (*"See Fig. 1 where the system comprises a digital color* ***image reading apparatus***.)

applying a light to a white reference plate from a light source when reading a first sheet of documents in a monochromatic reading mode reading monochromatic images from plural numbers of documents successively and receiving reflecting light from the white reference plate by the BK line sensor to output a digital monochromatic signal (*"****The image reader 1*** *also includes* ***white and black boards 8 and 9 for adjusting white and black levels of image signals****, respectively. When the* ***white and black boards 8 and 9 are irradiated with light*** *from the halogen exposure lamp 10, predetermined density signal levels can be obtained and can be used to correct the black and white levels."* column 6, lines 24-30). See also (*"****A selector 63 selects one of outputs a, b, and c*** *on the basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output.* ***These signals (C2,C1,C0) are output*** *as (0,0,0), (0,0,1), (0,1,0), and (1,0,0) in an order of,* ***e.g., Y, M, C, and Bk****.* ***These signals are also output as (0,1,1) serving as a monochromatic signal,*** *thereby obtaining color signals corrected to desired colors."* column 9, lines 1-9);

storing the digital monochromatic signal outputted from the BK line sensor as a first white reference data for a monochromatic signal (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28);

turning off the light to output a digital monochromatic signal from the BK line sensor (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

storing the digital monochromatic signal outputted from the BK line sensor when the light is turned off, as a black reference data for a monochromatic signal (*"In such a system, **data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.** In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"**The control unit 13 performs the entire control of the color reader 1,** i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503, **performs ON/OFF control and light amount control** of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and **performs control of a digitizer** 16 or a display unit through a signal line 505."* column 6 , lines 38-45);

executing a shading correction of the monochromatic signal that is a first reflecting light received by the BK line sensor from the first sheet of the documents and output by the BK line sensor based on the first white reference data for a monochromatic signal and the black reference data for a monochromatic signal (*"An analog circuit 3025 amplifies analog outputs from the CCD line sensors 3061, 3062, and 3063 and converts these analog signals into digital signals. A generator 3026 for signal for adjustment generates a reference signal for the analog circuit 3025. **A dark correction circuit 3027 performs dark correction of R, G, and B digital image signals from the analog circuit 3025. A shading correction circuit 3028 performs shading correction of an output signal from the dark correction circuit 3027.** A pixel shift correction circuit 3029 corrects a main-scan pixel shift of an output signal from the shading correction circuit 3028."* column 21, lines 16-26);

applying the light to the white reference plate from the light source when reading a second sheet of the documents in the monochromatic reading mode and receiving the reflecting light from the white reference plate by the BK line sensor to output a digital monochromatic signal (*"**The image reader 1** also includes **white and black boards 8 and 9 for adjusting white and black levels of image signals**, respectively. When the **white and black boards 8 and 9 are irradiated with light** from the halogen exposure lamp 10, predetermined density signal levels can be obtained and can be used to correct the black and white levels."* column 6, lines 24-30). See also (*"**A selector 63 selects one of outputs a, b, and c** on the*

basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output. ***These signals (C2,C1,C0) are output*** *as (0,0,0), (0,0,1), (0,1,0), and (1,0,0) in an order of,* ***e.g., Y, M, C, and Bk. These signals are also output as (0,1,1) serving as a monochromatic signal,*** *thereby obtaining color signals corrected to desired colors."* column 9, lines 1-9);

storing the digital monochromatic signal outputted from the BK line sensor as a second white reference data for a monochromatic signal (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28);

applying a light to the white reference plate from the light source when reading a first sheet of documents in a color reading mode reading color images from plural numbers of documents successively and receiving the reflecting light from the white reference plate by the R, G and B line sensors to output digital color signals (*"****The image reader 1*** *also includes* ***white and black boards 8 and 9 for adjusting white and black levels of image signals****, respectively. When the* ***white and black boards 8 and 9 are irradiated with light*** *from the halogen exposure lamp 10, predetermined density signal levels can be obtained and can be used to correct the black and white levels."* column 6, lines 24-30). See also (*"****A selector 63 selects one of outputs a, b, and c*** *on the basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output.* ***These signals (C2,C1,C0) are output*** *as (0,0,0), (0,0,1), (0,1,0), and (1,0,0) in an order of,* ***e.g., Y, M, C, and Bk. These signals are also output as (0,1,1) serving as a monochromatic signal,*** *thereby obtaining color signals corrected to desired colors."* column 9, lines 1-9);

storing the digital color signals outputted from the R, G and B line sensors as a first white reference data for color signals (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28);

storing the digital color signals outputted from the R, G and B line sensors when the light is turned off, as black reference data for color signals (*"In such a system, data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"**The control unit 13 performs the entire control of the color reader 1,** i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503, **performs ON/OFF control and light amount control** of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and **performs control of a digitizer** 16 or a display unit through a signal line 505."* column 6 , lines 38-45);

executing a shading correction of the color signal that is a first reflecting light received by the R, G and B line sensors from the first sheet of the documents and output by the R, G and B line sensors based on the first white reference data for color signal and the black reference data for color signal (***The R,G, and B digital signals are corrected by the shading correction circuit 3028 in the main scan direction.*** *In addition, a pixel shift in the main scan direction is performed by the pixel shift correction circuit 3029."* column 22, lines 36-40); (*"**A shading correction circuit 3028** performs **shading correction** of an output signal from the dark correction circuit 3027."* column 21, lines 22-24)

applying the light to the white reference plate from the light source when reading a second sheet of the documents in the color reading mode and receiving the reflecting light from the white reference plate by the R, G and B line sensors to output digital color signals (*"**The image reader 1** also includes **white and black boards 8 and 9 for adjusting white and black levels of image signals**, respectively. When the **white and black boards 8 and 9 are irradiated with light** from the halogen exposure lamp 10, predetermined density signal levels can be obtained and can be used to correct the black and white levels."* column 6, lines 24-30). See also (*"**A selector 63 selects one of outputs a, b, and c** on the basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output. **These signals (C2,C1,C0) are output** as (0,0,0), (0,0,1), (0,1,0),*

and (1,0,0) in an order of, ***e.g., Y, M, C, and Bk. These signals are also output as (0,1,1) serving as a monochromatic signal,*** *thereby obtaining color signals corrected to desired colors."* column 9, lines 1-9);

storing the digital color signals outputted from the R, G and B line sensors as a second white reference data for color signals (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.*** *In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28);

and executing a shading correction of the color signal that is the second reflecting light received by the R, G and B line sensors from the second sheet of the documents and output by the R, G and B line sensors based on the second white reference data for color signal only (***The R,G, and B digital signals are corrected by the shading correction circuit 3028*** *in the main scan direction. In addition, a pixel shift in the main scan direction is performed by the pixel shift correction circuit 3029."* column 22, lines 36-40).

Sakai '180 does not expressly disclose preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors; turning off the light to output digital color signals from the R, G and B line sensors.

Ikeda '638 discloses preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors {See Figs. 3A &3B which represents a CCD Sensor and R, G, B line sensors (*"First, third, and fifth sensors (or CCDs) (58a, 60a, and 62a) are arranged on a line LA, and* ***second and fourth sensors are arranged on a line LB separated from the line LA by four lines*** *(63.5 .mu.m.times.4=254 .mu.m)."* column 7, lines 62-66). See also (*"Color image signals obtained by reading an original while dividing the original into five portions and input to the video image processing circuit are* ***separated into three colors, i.e., G (green), B (blue), and R (red) by the sample/hold (S/H) circuit 502a.*** *Therefore, after S/H processing, signals of 3x5=15 systems*

are subjected to signal processing. The analog color signals sampled and held by the S/H circuit 502a in units of ***R, G, and B are convened to digital signals in units of first to fifth channels by the next A/D converter 503a****."* column 8, lines 52-61);

turning off the light to output digital color signals from the R, G and B line sensors (*"The memory corresponds to the 100-dpi memory L in the entire circuit shown in FIG. 2, and is used as a means for* ***generating switching signals for determining an 0N (executing) or OFF (not executing) state of various image process and edit modes, such as the above-mentioned color conversion****, image trimming (non-rectangular trimming), image painting (non-rectangular painting), and the like for shapes illustrated in, e.g., FIG. 37E. More specifically,in FIG. 2, the switching signals are supplied through signal lines BHi 123, DHi 122, FHi 121, GHi 119, PHi 145, and AHi 148* ***as ON/OFF switching signals for the color conversion circuit B, the color correction circuit D****, the character synthesizing circuit F, the image process and edit circuit G, the color balance circuit P, and the external apparatus image synthesizing circuit 502."* column 38, lines 32-46).

Sakai '180 and Ikeda '638 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an image processing apparatus which executes various processing operations of an input image to perform image edit."* Ikeda '638 at column 1, lines 13-15).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors and turning off the light to output digital color signals from the R, G and B line sensors as taught by Ikeda '638. The motivation for doing so would have been because it advantageous to provide an image processing apparatus which can precisely reproduce an original image. (*"It is still another object of the present invention to provide an image processing apparatus which can precisely reproduce an original image."* Ikeda '638 at column 2, lines 17-20). Therefore, it would have been obvious to combine Sakai '180 with Ikeda '638 to obtain the invention as specified in claim 11.

Sakai '180 as modified does not expressly disclose executing a shading correction of the monochromatic signal that is a second reflecting light received by the BK line sensor from the second sheet of the documents and output by the BK line sensor based on the second white reference data for a monochromatic signal only.

Kanno '266 discloses executing a shading correction of the monochromatic signal that is a second reflecting light received by the BK line sensor from the second sheet of the documents and output by the BK line sensor based on the second white reference data for a monochromatic signal only (*"A* ***shading correction circuit 1014 corrects an output non-uniformity with respect to each color of the line sensor 100*** *and the* ***inclination of the quantity of light from a light source.***" column 8, lines 32-35). (*"****Monochromatic conversion processing for converting an image having a plurality of colors*** *into a monochromatic image of a selected single color is performed as described below. A designated color (R1, G1, B1) is converted into density signals (C1 (cyan), M1 (magenta), and Y1 (yellow)* ***and Bk1 (black)),*** *and a maximum value MX in these values is stored. A signal ND (neutral density) representing a density is calculated by the following equation from density signals (C, M, Y) converted from input image signals (R, G, B).*" column 2, lines 14-23).

Sakai '180 and Kanno '266 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an apparatus and a method for processing color images and, more particularly, to a color image processing apparatus..."* Ikeda '638 at column 1, lines 8-10).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding executing a shading correction of the monochromatic signal that is a second reflecting light received by the BK line sensor from the second sheet of the documents and output by the BK line sensor based on the second white reference data for a monochromatic signal only as taught by Kanno '266. The motivation for doing so would have been because it advantageous to provide a color image processing apparatus and a

color image processing method which makes it possible to suitably convert a color (*"...an object of the present invention is to provide a color image processing apparatus and a color image processing method which make it possible to suitably convert a color..."* Kanno '266 at column 3, lines 31-34). Therefore, it would have been obvious to combine Sakai '180 with Kanno '266 to obtain the invention as specified in claim 11.

Regarding claim 12; Sakai '180 discloses an image reading method, comprising (*"See Fig. 1 where the system comprises a digital color image reading apparatus.*)

applying a light to a white reference plate from a light source and receiving reflecting light from the white reference plate by the BK line sensor and R, G and B line sensors to output a digital monochromatic signal and digital color signals (*"**The image reader 1** also includes **white and black boards 8 and 9 for adjusting white and black levels of image signals**, respectively. When the **white and black boards 8 and 9 are irradiated with light** from the halogen exposure lamp 10, predetermined density signal levels can be obtained and can be used to correct the black and white levels."* column 6, lines 24-30). See also (*"**A selector 63 selects one of outputs a, b, and c** on the basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output. **These signals (C2,C1,C0) are output** as (0,0,0), (0,0,1), (0,1,0), and (1,0,0) in an order of, **e.g., Y, M, C, and Bk. These signals are also output as (0,1,1) serving as a monochromatic signal,** thereby obtaining color signals corrected to desired colors."* column 9, lines 1-9);

storing the digital monochromatic signal and the digital color signals as white reference data (*"In such a system, **data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images**. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28);

turning off the light to output a digital monochromatic signal from the BK line sensor and color signals from the R, G and B line sensors (*"**The control unit 13 performs the entire***

control of the color reader 1, *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

storing the digital monochromatic signal outputted from the BK line sensor and the color signals from the R, G and B line sensors when the light is turned off, as black reference data (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.*** *In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

judging whether plural number of documents are monochromatic documents or color documents by sequentially scanning the documents (*"****A selector 63 selects one of outputs a, b, and c*** *on the basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output.* ***These signals (C2,C1,C0) are output*** *as (0,0,0), (0,0,1), (0,1,0), and (1,0,0) in an order of,* ***e.g., Y, M, C, and Bk****.* ***These signals are also output as (0,1,1) serving as a monochromatic signal,*** *thereby obtaining color signals corrected to desired colors The select signals C0, C1, and C2 are output by the CPU 22 in accordance with an image forming sequence of the color printer 2."* column 9, lines 1-11);

and executing a shading correction of the color signal that is the reflecting light received and output by the R, G and B line sensors based on the white reference data only when the first sheet of the document is judged to be a color document (***The R,G, and B digital***

signals are corrected by the shading correction circuit 3028 *in the main scan direction. In addition, a pixel shift in the main scan direction is performed by the pixel shift correction circuit 3029."* column 22, lines 36-40).

Sakai '180 does not expressly disclose preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors.

Ikeda '638 discloses preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors {See Figs. 3A &3B which represents a CCD Sensor and R, G, B line sensors (*"First, third, and fifth sensors (or CCDs) (58a, 60a, and 62a) are arranged on a line LA, and* ***second and fourth sensors are arranged on a line LB separated from the line LA by four lines*** *(63.5 .mu.m.times.4=254 .mu.m)."* column 7, lines 62-66). See also (*"Color image signals obtained by reading an original while dividing the original into five portions and input to the video image processing circuit are* ***separated into three colors, i.e., G (green), B (blue), and R (red) by the sample/hold (S/H) circuit 502a.*** *Therefore, after S/H processing, signals of 3x5=15 systems are subjected to signal processing. The analog color signals sampled and held by the S/H circuit 502a in units of* ***R, G, and B are convened to digital signals in units of first to fifth channels by the next A/D converter 503a****."* column 8, lines 52-61);

Sakai '180 and Ikeda '638 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an image processing apparatus which executes various processing operations of an input image to perform image edit."* Ikeda '638 at column 1, lines 13-15).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors as taught by Ikeda '638.The motivation for doing so would have been because it advantageous to provide an image processing apparatus which can precisely reproduce an original image (*"It is still another object of the present invention to provide an image processing*

apparatus which can precisely reproduce an original image." Ikeda '638 at column 2, lines 17-20). Therefore, it would have been obvious to combine Sakai '180 with Ikeda '638 to obtain the invention as specified in claim 12.

Sakai '180 does not expressly disclose executing a shading correction of the monochromatic image signal that is the reflecting light from the document received and output by the BK line sensor based on the white reference data and the black reference data when a first sheet of the document is judged to be a monochromatic document.

Kanno '266 discloses executing a shading correction of the monochromatic image signal that is the reflecting light from the document received and output by the BK line sensor based on the white reference data and the black reference data when a first sheet of the document is judged to be a monochromatic document (*"An analog circuit 3025 amplifies analog outputs from the CCD line sensors 3061, 3062, and 3063 and converts these analog signals into digital signals. A generator 3026 for signal for adjustment generates a reference signal for the analog circuit 3025.* ***A dark correction circuit 3027 performs dark correction of R, G, and B digital image signals from the analog circuit 3025. A shading correction circuit 3028 performs shading correction of an output signal from the dark correction circuit 3027****. A pixel shift correction circuit 3029 corrects a main-scan pixel shift of an output signal from the shading correction circuit 3028."* column 21, lines 16-26);

Sakai '180 and Kanno '266 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an apparatus and a method for processing color images and, more particularly, to a color image processing apparatus..."* Ikeda '638 at column 1, lines 8-10).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding executing a shading correction of the monochromatic image signal that is the reflecting light from the document received and output by the BK line sensor based on

the white reference data and the black reference data when a first sheet of the document is judged to be a monochromatic document as taught by Kanno '266. The motivation for doing so would have been because it advantageous to provide a color image processing apparatus and a color image processing method which makes it possible to suitably convert a color (*"...an object of the present invention is to provide a color image processing apparatus and a color image processing method which make it possible to suitably convert a color.."* Kanno '266 at column 3, lines 31-34). Therefore, it would have been obvious to combine Sakai '180 with Kanno '266 to obtain the invention as specified in claim 12.

Regarding claim 13; Sakai '180 discloses executing a shading correction of the color signals that are the reflecting light from the document received and output from the R, G and B line sensors when the second sheet of the document is judged to be a color document, based on the white reference data only (*The R, G, and B digital signals are corrected by the shading correction circuit 3028 in the main scan direction. In addition, a pixel shift in the main scan direction is performed by the pixel shift correction circuit 3029."* Sakai '180 at column 22, lines 36-40).

Sakai '180 as modified does not expressly disclose executing a shading correction of the monochromatic signal that is the reflecting light from the document received by and output from the BK line sensor based on the white reference data and the black reference data when a second sheet of the document is judged to be a monochromatic document.

Kanno '266 discloses executing a shading correction of the monochromatic signal that is the reflecting light from the document received by and output from the BK line

sensor based on the white reference data and the black reference data when a second sheet of the document is judged to be a monochromatic document (*"A **shading correction circuit 1014 corrects an output non-uniformity with respect to each color of the line sensor 100** and the **inclination of the quantity of light from a light source**."* column 8, lines 32-35). (*"**Monochromatic conversion processing for converting an image having a plurality of colors** into a monochromatic image of a selected single color is performed as described below. A designated color (R1, G1, B1) is converted into density signals (C1 (cyan), M1 (magenta), and Y1 (yellow) **and Bk1 (black)),** and a maximum value MX in these values is stored. A signal ND (neutral density) representing a density is calculated by the following equation from density signals (C, M, Y) converted from input image signals (R, G, B)."* column 2, lines 14-23).

Sakai '180 and Kanno '266 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an apparatus and a method for processing color images and, more particularly, to a color image processing apparatus..."* Ikeda '638 at column 1, lines 8-10).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding executing a shading correction of the monochromatic signal that is the reflecting light from the document received by and output from the BK line sensor based on the white reference data and the black reference data when a second sheet of the document is judged to be a monochromatic document as taught by Kanno '266. The motivation for doing so would have been because it advantageous to provide a color image processing apparatus and a color image processing method which makes it possible to suitably convert a color (*"...an object of the present invention is to provide a color image processing apparatus and a color image processing method which make it possible to suitably convert a color.."* Kanno '266 at column 3, lines 31-34). Therefore, it would have been obvious to combine Sakai '180 with Kanno '266 to obtain the invention as specified in claim 12.

Regarding claim 16; Sakai '180 discloses an image reading method comprising the steps: storing digital color signals that are reflected light of light applied from a light source to a white reference plate and received and output by the R, G and B line sensors as white reference data for color signals (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

storing a digital monochromatic signal that is reflected light of the light applied from the light source to the white reference plate and received and output by the BK line sensor as white reference data for a monochromatic signal (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

storing the digital color signals that are output from the R, G and B line sensors as black reference data for color signals with the light source is turned off (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control***

of the color reader 1, *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

storing the digital monochromatic signal that is output from the BK line sensor as black reference data for a monochromatic signal with the light source is turned off (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images****. In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

judging whether plural number of documents are monochromatic documents or color documents by sequentially scanning the documents (*"****A selector 63 selects one of outputs a, b, and c*** *on the basis of a truth table in FIG. 10B in response to select signals C0 and C1 (567 and 568). The select signals C0 and C1 and a select signal C2 correspond to color signals to be output.* ***These signals (C2,C1,C0) are output*** *as (0,0,0), (0,0,1), (0,1,0), and (1,0,0) in an order of,* ***e.g., Y, M, C, and Bk. These signals are also output as (0,1,1) serving as a monochromatic signal,*** *thereby obtaining color signals corrected to desired colors The select signals C0, C1, and C2 are output by the CPU 22 in accordance with an image forming sequence of the color printer 2."* column 9, lines 1-11);

executing a shading correction of color signals output from the R, G and B line sensors by receiving the reflecting light from the document by the R, G and B line sensors based on the white reference data for color signals and the black reference data for color signals when a first sheet of the document is judged to be a color document (***The R,G, and B digital signals are corrected by the shading correction circuit 3028 in the main scan direction.*** *In*

addition, a pixel shift in the main scan direction is performed by the pixel shift correction circuit 3029." column 22, lines 36-40).

Sakai '180 does not expressly disclose preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors.

Ikeda '638discloses preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors {See Figs. 3A &3B which represents a CCD Sensor and R, G, B line sensors (*"First, third, and fifth sensors (or CCDs) (58a, 60a, and 62a) are arranged on a line LA, and* ***second and fourth sensors are arranged on a line LB separated from the line LA by four lines*** *(63.5 .mu.m.times.4=254 .mu.m)."* column 7, lines 62-66). See also (*"Color image signals obtained by reading an original while dividing the original into five portions and input to the video image processing circuit are* ***separated into three colors, i.e., G (green), B (blue), and R (red) by the sample/hold (S/H) circuit 502a.*** *Therefore, after S/H processing, signals of 3x5=15 systems are subjected to signal processing. The analog color signals sampled and held by the S/H circuit 502a in units of* ***R, G, and B are convened to digital signals in units of first to fifth channels by the next A/D converter 503a****."* column 8, lines 52-61);

Sakai '180 and Ikeda '638 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an image processing apparatus which executes various processing operations of an input image to perform image edit."* Ikeda '638 at column 1, lines 13-15).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors as taught by Ikeda '638. The motivation for doing so would have been because it advantageous to provide an image processing apparatus which can precisely reproduce an original image (*"It is still another object of the present invention to provide an image processing apparatus which can precisely reproduce an original image."* Ikeda '638 at column 2, lines 17-20).

Therefore, it would have been obvious to combine Sakai '180 with Ikeda '638 to obtain the invention as specified in claim 16.

Sakai '180 as modified does not expressly disclose executing a shading correction of a monochromatic signal output from the BK line sensor by receiving the light from the document by the BK line sensor based on the monochromatic white reference data for a monochromatic signal and the black reference data for a monochromatic signal when the first sheet of the document is judged to be a monochromatic document.

Kanno '266 and executing a shading correction of a monochromatic signal output from the BK line sensor by receiving the light from the document by the BK line sensor based on the monochromatic white reference data for a monochromatic signal and the black reference data for a monochromatic signal when the first sheet of the document is judged to be a monochromatic document (*"A **shading correction circuit 1014 corrects an output non-uniformity with respect to each color of the line sensor 100** and the **inclination of the quantity of light from a light source**."* column 8, lines 32-35). (*"**Monochromatic conversion processing for converting an image having a plurality of colors** into a monochromatic image of a selected single color is performed as described below. A designated color (R1, G1, B1) is converted into density signals (C1 (cyan), M1 (magenta), and Y1 (yellow) **and Bk1 (black)),** and a maximum value MX in these values is stored. A signal ND (neutral density) representing a density is calculated by the following equation from density signals (C, M, Y) converted from input image signals (R, G, B)."* column 2, lines 14-23).

Sakai '180 and Kanno '266 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an apparatus and a method for processing color images and, more particularly, to a color image processing apparatus..."* Ikeda '638 at column 1, lines 8-10).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by

adding executing a shading correction of a monochromatic signal output from the BK line sensor by receiving the light from the document by the BK line sensor based on the monochromatic white reference data for a monochromatic signal and the black reference data for a monochromatic signal when the first sheet of the document is judged to be a monochromatic document as taught by Kanno '266. The motivation for doing so would have been because it advantageous to provide a color image processing apparatus and a color image processing method which makes it possible to suitably convert a color (*"...an object of the present invention is to provide a color image processing apparatus and a color image processing method which make it possible to suitably convert a color.."* Kanno '266 at column 3, lines 31-34). Therefore, it would have been obvious to combine Sakai '180 with Kanno '266 to obtain the invention as specified in claim 16.

Regarding claim 18; Sakai '180 discloses wherein the BK line sensor has first and second shift gates and first and second analog shift registers in which charges corresponding to odd pixels are supplied to the first analog shift register via the first shift gate and charges corresponding to even pixels are supplied to the second shift register via the second shift gate (See Fig. 2A #45 for the shift correction circuit, #45 the A/D converter *"The image memory apparatus 3 is an apparatus for quantizing a digital image read by the color reader 1 or the film scanner 34 and* ***an analog video signal*** *from the SV recording reproducing unit 3e..."* column 5, lines 40-42). (22*"The read position errors between the preceding second and fourth channels and the remaining first, third, and fifth channels are corrected by the color sensors 6 and a* ***shift correction circuit 45****. Shift-corrected signals from the* ***shift correction circuit 45*** *are input to a black correction/white correction circuit 46..."* column 6, lines 64-67 thru column 7, lines 1-2). (*"The spectral characteristics of color separation filters arranged* ***in units of pixels*** *in the color sensors"* column 8, lines 15-17).

Regarding claim 19; Sakai '180 discloses wherein the BK line sensor has first and second shift gates and first and second analog shift registers in which charges corresponding to odd pixels are supplied to the first analog shift register via the first shift gate and charges corresponding to even pixels are supplied to the second shift register via the second shift gate (See Fig. 2A #45 for the shift correction circuit, #45 the A/D converter *"The image memory apparatus 3 is an apparatus for quantizing a digital image read by the color reader 1 or the film scanner 34 and* ***an analog video signal*** *from the SV recording reproducing unit 3e..."* column 5, lines 40-42). (22*"The read position errors between the preceding second and fourth channels and the remaining first, third, and fifth channels are corrected by the color sensors 6 and a* ***shift correction circuit 45****. Shift-corrected signals from the* ***shift correction circuit 45*** *are input to a black correction/white correction circuit 46..."* column 6, lines 64-67 thru column 7, lines 1-2). (*"The spectral characteristics of color separation filters arranged* ***in units of pixels*** *in the color sensors"* column 8, lines 15-17).

Regarding claim 20; Sakai '180 discloses wherein the BK line sensor has first and second shift gates and first and second analog shift registers in which charges corresponding to odd pixels are supplied to the first analog shift register via the first shift gate and charges corresponding to even pixels are supplied to the second shift register via the second shift gate (See Fig. 2A #45 for the shift correction circuit, #45 the A/D converter *"The image memory apparatus 3 is an apparatus for quantizing a digital image read by the color reader 1 or the film scanner 34 and* ***an analog video signal*** *from the SV recording reproducing unit 3e..."* column 5, lines 40-42). (22*"The read position errors between the preceding second and fourth channels and the remaining first, third, and fifth channels are corrected by the color sensors 6 and a* ***shift correction circuit 45****. Shift-corrected signals from the* ***shift correction circuit 45*** *are input to a black correction/white correction circuit 46..."* column 6, lines 64-67 thru column 7, lines 1-2). (*"The spectral characteristics of color separation filters arranged* ***in units of pixels*** *in the color sensors"* column 8, lines 15-17).

Regarding claim 21; Sakai '180 discloses wherein the BK line sensor has first and second shift gates and first and second analog shift registers in which charges corresponding to odd pixels are supplied to the first analog shift register via the first shift gate and charges corresponding to even pixels are supplied to the second shift register via the second shift gate (See Fig. 2A #45 for the shift correction circuit, #45 the A/D converter *"The image memory apparatus 3 is an apparatus for quantizing a digital image read by the color reader 1 or the film scanner 34 and* ***an analog video signal*** *from the SV recording reproducing unit 3e..."* column 5, lines 40-42). (22*"The read position errors between the preceding second and fourth channels and the remaining first, third, and fifth channels are corrected by the color sensors 6 and a* ***shift correction circuit 45****. Shift-corrected signals from the* ***shift correction circuit 45*** *are input to a black correction/white correction circuit 46..."* column 6, lines 64-67 thru column 7, lines 1-2). (*"The spectral characteristics of color separation filters arranged* ***in units of pixels*** *in the color sensors"* column 8, lines 15-17).

5. **Claims 14 & 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai '180 in combination with Ikeda '638.

Regarding claim 14; Sakai '180 discloses an image reading method, comprising: storing a digital monochromatic signal and digital color signals that are output from the BK line sensor and the R, G and B line sensors as a black reference data with a light source turned off when a first copy is preferential among the first copy being preferential and a ready time being preferential, at the time when power is turned ON (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.*** *In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the*

halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45);

Sakai '180 does not expressly disclose preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors.

Ikeda '638 preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors {See Figs. 3A &3B which represents a CCD Sensor and R, G, B line sensors (*"First, third, and fifth sensors (or CCDs) (58a, 60a, and 62a) are arranged on a line LA, and* ***second and fourth sensors are arranged on a line LB separated from the line LA by four lines*** *(63.5 .mu.m.times.4=254 .mu.m)}."* column 7, lines 62-66). See also (*"Color image signals obtained by reading an original while dividing the original into five portions and input to the video image processing circuit are* ***separated into three colors, i.e., G (green), B (blue), and R (red) by the sample/hold (S/H) circuit 502a.*** *Therefore, after S/H processing, signals of 3x5=15 systems are subjected to signal processing. The analog color signals sampled and held by the S/H circuit 502a in units of* ***R, G, and B are convened to digital signals in units of first to fifth channels by the next A/D converter 503a.***" column 8, lines 52-61);

Sakai '180 and Ikeda '638 are combinable because they are from same field of endeavor of image processing apparatuses (*"The present invention relates to an image processing apparatus which executes various processing operations of an input image to perform image edit."* Ikeda '638 at column 1, lines 13-15).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the image processing apparatus as taught by Sakai '180 by adding preparing a four-line CCD sensor comprising a BK line sensor and R, G and B line sensors as taught by Ikeda '638. The motivation for doing so would have been because it advantageous to provide an image processing apparatus which can precisely reproduce an original image. (*"It is still another object of the present invention to provide an image processing apparatus which can precisely reproduce an original image."* Ikeda '638 at column 2, lines 17-20).

Therefore, it would have been obvious to combine Sakai '180 with Ikeda '638 to obtain the invention as specified in claim 12.

Regarding claim 15; Sakai '180 discloses storing a digital monochromatic signal and digital color signals that are reflecting light of the light applied to a white reference plate from the light source and then received and output by the BK line sensor and the R, G and B line sensors as a white reference data when the first copy is preferential at the time when power is turned ON (*"In such a system,* ***data stored in the color image memory apparatus is repeatedly sent to the digital color copying machine to obtain a plurality of color images.*** *In addition, when the monitor display is connected to the digital color copying machine, the stored images can be checked."* column 1, lines 24-28); See also (*"****The control unit 13 performs the entire control of the color reader 1,*** *i.e., performs control of a stepping motor driving circuit 15 for pulse-driving a stepping motor 14 for moving the scanning unit 11 through a signal line 503,* ***performs ON/OFF control and light amount control*** *of the halogen exposure lamp 10 by an exposure lamp driver 21 through a signal line 504, and* ***performs control of a digitizer*** *16 or a display unit through a signal line 505."* column 6 , lines 38-45).

Examiner Notes

6. The Examiner cites particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully considers the references in its entirety as potentially teaching all or part of the claimed invention, as

well as the context of the passage as taught by the prior art or as disclosed by the Examiner.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCUS T. RILEY whose telephone number is (571)270-1581. The examiner can normally be reached on Monday - Friday, 7:30-5:00, est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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